Analytic Implications of the NATO Defence Planning Process

SAS-081 Specialist Team Summary Report

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14. ABSTRACT
The SAS-081 Specialist Team on the Analytic Implications of the NATO Defence Planning Process(NDPP) was formed to the review of current best practices in operations analysis support to national defence planning. The aim was to support the identification of common approaches with relevance to the NDPP. This both provided participants with insight and understanding of contemporary approaches and issues within national and NATO defence planning, and allowed the identification of emerging best practice that is being fed into evolving NATO analytic processes. The Specialist Team considered five key themes of immediate relevance to the evolution of analytic support to the NDPP, specifically: Use of scenario-based analysis and definition of the scenario space; Methodologies for identification and definition of required capabilities, including gaps and redundancies; Approaches to capability balancing and risk assessment; Prioritisation of capability shortfalls or gaps; Introduction of novel concepts / solutions. National approaches within each of these areas were collated and compared, and general conclusions agreed that formed the basis for a set on recommendations on analytic implications for consideration by the NDPP decision makers.

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- *Use of scenario-based analysis and definition of the scenario space;*
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National approaches within each of these areas were collated and compared, and general conclusions agreed that formed the basis for a set on recommendations on analytic implications for consideration by the NDPP decision makers.

1.0 INTRODUCTION

In order to complement and support the above objectives, the SAS-081 Program Committee concluded that detailed technical consideration should be given to the analytic implications of the revised NATO Defence Planning Process (NDPP). The Program Committee recommended the formation of a dedicated Specialist Team from the NATO members to consider these technical implications in light of evolving Defence Planning procedures within nations. This Specialist Team complemented both the main SAS-081 symposium and on-going NATO initiatives such as the 2009 NATO Headquarters (HQ) Capability-based Planning (CBP) symposium and NDPP Domain Harmonisations workshops, and the Allied Command Transformation (ACT) Generic Planning Situation workshops to run through 2010.

The Specialist Team focused on the review of current best practices in operations analysis support to national defence planning. The aim was to support the identification of common approaches with relevance to the NDPP, especially in regards to addressing balance in national capabilities and the role played by scenario-based assessment.

1.1 SAS-081 Specialist Team Workshop

The SAS-081 Specialist Team conducted a specialists' workshop on the Analytic Implications of the NATO Defence Planning Process, at the NATO Consultation, Command and Control Agency (NATO C3 Agency) in The Hague, The Netherlands, from 2nd – 4th March 2010.

1.1.1 Specialist Team Composition

The Specialist Team was open to participation from all NATO members on a voluntary basis, and was

ultimately composed of Subject Matter Experts (SMEs) from nine NATO nations, of whom eight attended the workshop itself. Of the workshop attendees, the members from Canada, France, Germany, Portugal, The Netherlands, Norway and the United States worked within their national Ministries / Departments of Defence or associated national agencies and organisations, whilst the member from Italy came from industry. In addition, members from the United Kingdom Ministry of Defence provided detailed input through a survey response, but did not attend the workshop. These national SMEs provided in-depth expertise and guidance from both the military and analytic perspective.

In addition to the national SMEs, the Specialist Team benefitted from very strong interest and support from the NATO Defence Planning community. ACT Staff Element Europe (SEE) co-chaired the workshop, and ACT SEE staff officers from the Requirements & Capabilities Planning and Implementation Division (RCPI, TC-60) led each panel session and mediated all discussions. The NATO Defence Planning Staff Team (DPST) Core Element provided crucial insight and guidance on the NDPP, including an NDPP 'Food for Thought' read ahead, and both the International Staffs (IS) and International Military Staffs (IMS) of NATO Headquarters (NATO HQ) were represented. Members from HQ ACT and the NATO C3 Agency complimented this military contribution with input from the analytic communities within NATO. The meeting was sponsored by the NATO C3 Agency Defence Planning Peer Competency Network (PCN), and staff from the NATO C3 Agency supported national SMEs in the completion of their survey responses, and collated and summarised the national inputs for plenary discussion.

1.1.2 Specialist Team Working Practices

The Specialist Team considered five key themes of immediate relevance to the evolution of analytic support to the NDPP, specifically:

- Use of scenario-based analysis and definition of the scenario space;
- Methodologies for identification and definition of required capabilities, including gaps and redundancies;
- Approaches to capability balancing and risk assessment;
- Prioritisation of capability shortfalls or gaps;
- Introduction of novel concepts / solutions.

Intention was to both provide participants with insight and understanding of contemporary approaches and issues within national and NATO defence planning, and allow the identification of emerging best practice that can be fed into evolving NATO analytic processes.

Each of the national SMEs completed a detailed survey response on the approaches and techniques in use within their nation. These responses were then collated together, and used as the basis for focussed panel discussions on each of the five topics during the workshop itself. This discussion allowed for the identification for the general themes and issues that are summarised in this report.

In addition, the national SMEs each provided an introductory overview presentation on relevant aspects of their nation's defence planning processes. These briefs were extremely helpful in providing insight into the alternative approaches in use within each nation, and were much appreciated by all participants. Slides from these national briefs have been used in this report to illustrate salient issues and approaches.

2.0 NATO DEFENCE PLANNING PROCESS OVERVIEW

Since 2008, NATO has been going through the process of defining and implementing a new or evolved overarching process for defence planning, the NATO Defence Planning Process. The aim of the NDPP is to provide a framework within which national and Alliance defence planning activities can be harmonised to meet agreed targets in the most effective way. It is intended to enable the timely identification, development and delivery of the necessary range of forces that are interoperable and adequately prepared, equipped, trained and supported as well as the associated military and non-military capabilities to undertake the Alliance's full spectrum of missions.

NATO defence planning occurs within a structured process which must offer sufficient flexibility to ensure it remains responsive to changing circumstances and the needs of the Alliance and individual Allies. The process needs to be integrated to the maximum degree possible and focus on medium- and longer-term capability development, while at the same time remaining responsive to unanticipated requirements arising from current operations.

The NDPP consists of the five main functions or steps, which are generally sequential and cyclical in nature. The five steps are shown in Figure 1 and a brief overview given below:

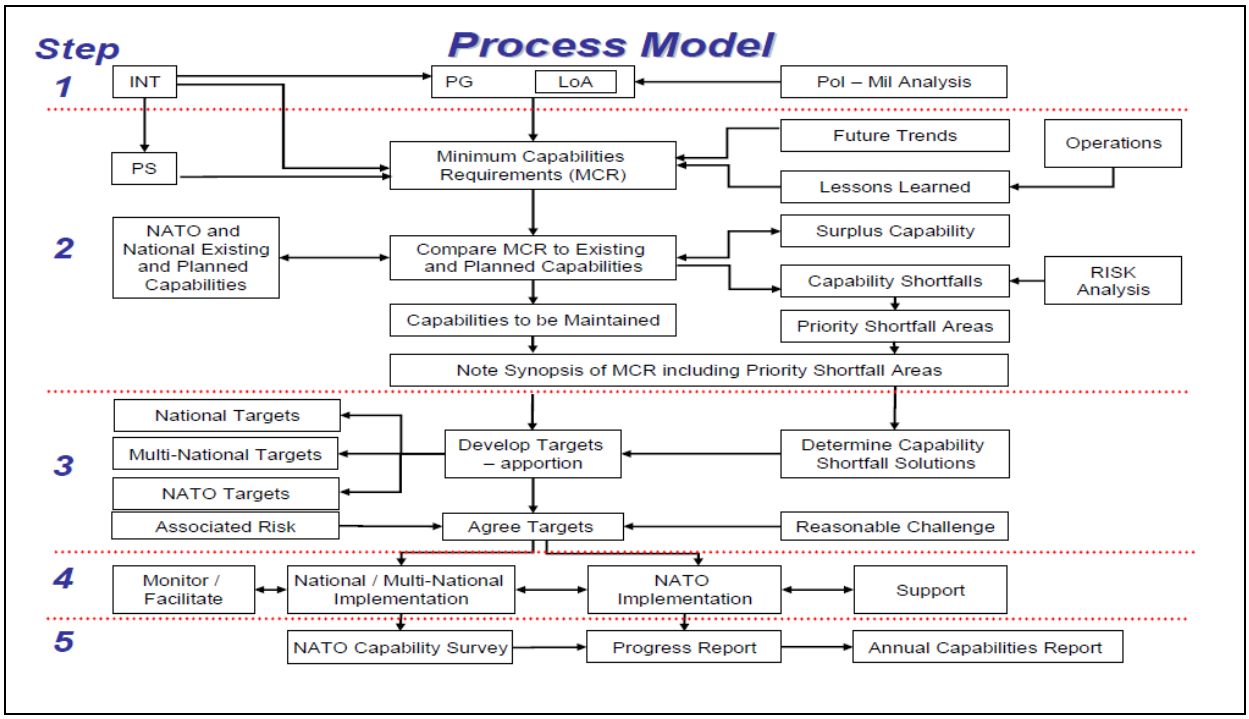

Figure 1: The NATO Defence Planning Process

a. **Step 1: Establish political guidance**. NATO political guidance (PG) provides the overall aims and objectives to be met by the Alliance within the framework of Alliance defence planning, as informed by NATO Agreed Intelligence (INT) and the political-military analysis by NATO and national staffs. It clearly defines what the Alliance should be able to do in broad qualitative and in quantitative capability terms as well as the associated priorities, and hence provides the Level of Ambition (LoA).

b. **Step 2: Determine requirements**. A comprehensive and detailed analysis is conducted to identify the capabilities required to achieve that ambition and to steer capability development efforts of Allies and within NATO. This requirements derivation process develops planning situations (PS) from INT, and uses these to develop the Minimum Capability Requirements (MCR). The MCR is then cross-checked against the capabilities known to exist within nations/NATO in order to identify and prioritise capability shortfalls.

c. **Step 3: Apportion requirements and set targets**. This step covers the function of apportioning requirements to nations and setting targets for them, on the basis of fair burden sharing and reasonable challenge. These targets can be met either individually or multi-nationally. In addition, some targets or appropriate elements thereof can be assigned for collective (i.e. NATO common-funded) implementation.

d. **Step 4: Facilitate implementation.** The fourth function, that of facilitating implementation, is a continuous activity. This function seeks to acquire the capabilities required by the Alliance by monitoring and encouraging national implementation, by facilitating and supporting multinational implementation and by executing collective implementation.

e. **Step 5: Review results**. Finally, the fifth function, review results, seeks to examine the degree to which the aims and objectives set out in the NATO political guidance and the associated targets have been met. It also seeks to assess the ability of NATO to meet its ambitions, and to offer feed-back and direction for the defence planning process and its associated activities for the next cycle and/or any necessary mid-term and out-of cycle actions.

3.0 USE OF SCENARIO-BASED ANALYSIS AND DEFINITION OF THE SCENARIO SPACE

3.1 Use of Scenario-based Analysis

Scenario-based analysis was confirmed as a fundamental element of contemporary analytic support to national capability-based Defence Planning. All the nations represented used some form of scenario planning to structure, scope or illustrate their national activities.

It was highlighted that scenario-based analysis could be a misleading term, as it could be wrongly interpreted that it provided an alternative to capability-based analysis. The group emphasised that scenario analysis should rather be seen as a vital component of robust capability-based planning.

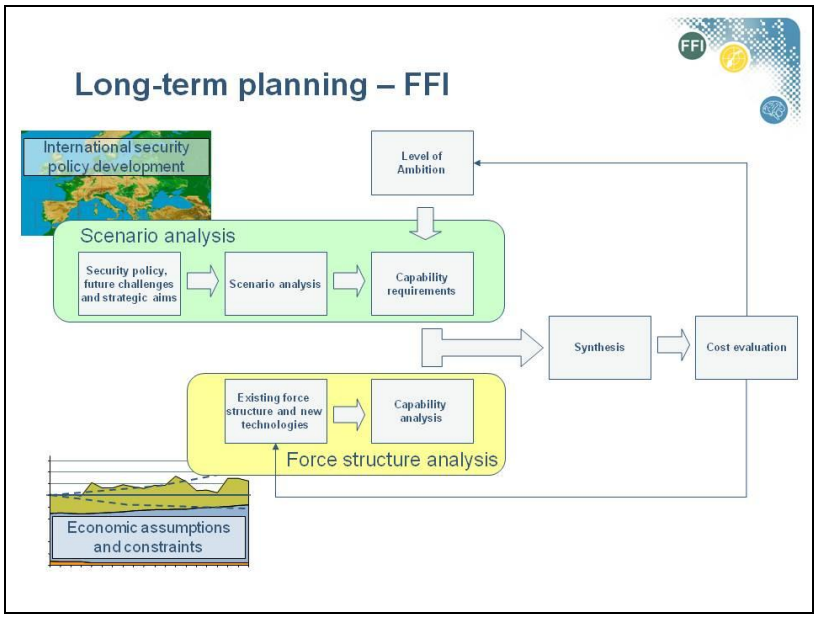

Figure 2: Role of scenarios within Capability Based Planning (Norway)

Although scenarios were generally employed, the particular interpretation of what should be regarded as a scenario differed across nations. The majority of nations represented utilised scenarios reflecting particular military operational-tactical contingencies, and developed these scenarios into specific planning situations detailing the operation, together with associated assumptions on opponent forces, terrain, and environmental features.

Most nations have implemented an explicit link between national defence policy and definition of their national scenario set. The scenarios employed are derived from national strategic guidance, as articulated through government policy papers. The national strategic guidance generally defines the roles and missions of the nation's armed forces, and describes high-level aspects of the future security environment. National defence policy documents do not typically explicitly define a defence planning scenario set. Rather, the national scenario sets are developed subsequently, to span the spectrum of defined roles and missions for each nation.

National defence policy papers tend to be periodically issued or updated on regular cycles. However, in some cases this process has only recently been instantiated, and in other cases there is no set schedule of updates. Certain nations are in the process of transitioning from a cyclical to a continuous model for their defence planning, and are working through the implications of that change.

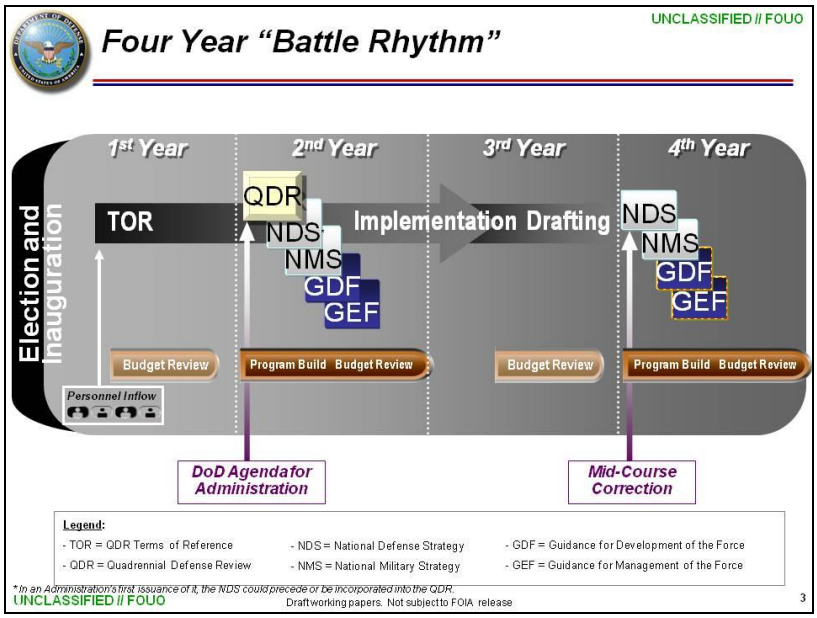

Figure 3: Cyclical defence planning- the USA Quadrennial Defense Review (USA)

The primary benefits of the scenario-based approach were identified as:

- Enhanced military credibility;
- Provide a common framework for planning across different defence domains or components, or even among other government planning processes;
- Maximise analytic rigour and traceability;
- Provide tool for quantification;
- Give means of understanding interactions between capabilities.

The potential problems or issues that must be managed within scenario-based assessment were to ensure a sufficiently representative spectrum of factors, addressing issues such as interagency coordination, service biases and the need for concurrency analysis. Moreover, most SMEs acknowledged the significant effort required to maintain currency of scenario data and assumptions, and potential impacts or consequences of changing policy. It was recognised that, given the inherent uncertainties in the future security environment, the results of scenario-based defence planning must be carefully interpreted and applied.

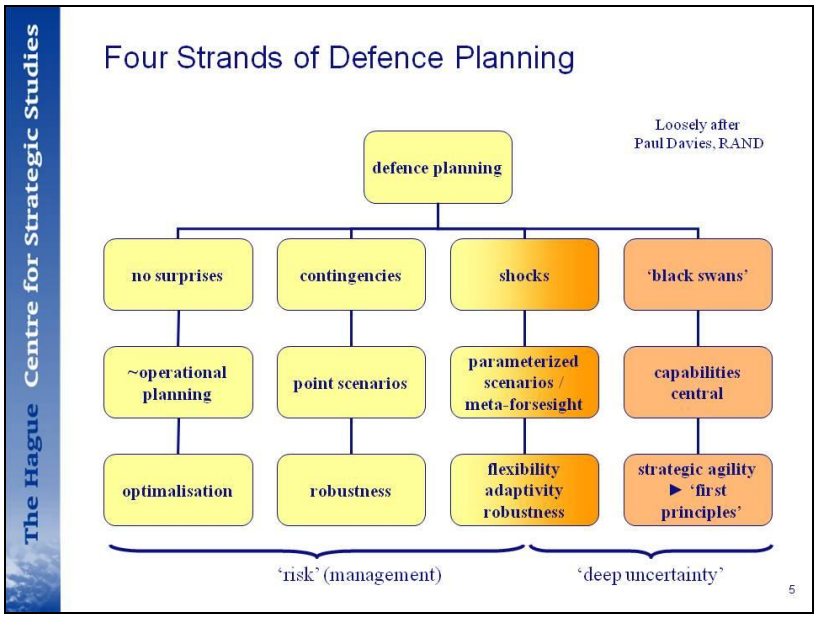

Figure 4: Impact of uncertainty on defence planning approaches (The Netherlands)

3.2 Classification of Scenarios / Mission Types

All of the nations involved employ specific or real-world scenarios, incorporating actual geography and explicit threats or crisis descriptions. The consensus across the group was that the benefits of scenario-based assessment are maximised when real-world scenarios are employed. Such scenarios, particularly where explicitly linked to standing defence policy and national threat assessments, provide the greatest degree of military credibility and buy-in, and are generally the easiest to scope and specify. Key elements such as geography, environment and/or threat can be derived directly from the scenario definition, and are thus 'givens', avoiding the need to expend time and effort both creating and justifying fictitious settings or assumptions.

The most broadly recognised advantage of generic scenarios was the reduction in political sensitivity and potentially security classification. This would make them easier to work with internally, as well as allowing for collaboration with allies. In addition, generic scenarios may be more suitable for analysis of the longer-term future or to support consideration of emergent threats. There were, however, some significant issues. Generic scenarios may overlook important facets or features of the real-world. It can be problematic to justify capability requirements emerging from generic scenarios, as the necessary audit trail is difficult to create, given the reliance on (in principle) representative, but (in practice) fictitious, driving assumptions. Furthermore, it was highlighted that executive-level approval for generic scenarios could be more difficult to secure than for real-world scenarios.

A number of nations have implemented a multi-tiered approach to scenario classification, with generic categories at the higher levels, supported by one or more specific, real-world scenarios as case studies at the more detailed levels. The generic layers are typically categorised by mission type, in some cases directly reflecting definitions provided in national defence policy. This hybrid approach provides many of the benefits of both the generic and real-world options, namely:

- Provides a direct and explicit link to defence policy and guidance;
- Allows the full breadth of military missions and roles to be considered generically at the higher levels, whilst avoiding political sensitivities and potential security classification issues about

identifying specific threats;

- Retains real-world case studies at the detailed layers to provide the necessary robustness for quantifying requirements and ensuring relevance of capability needs.

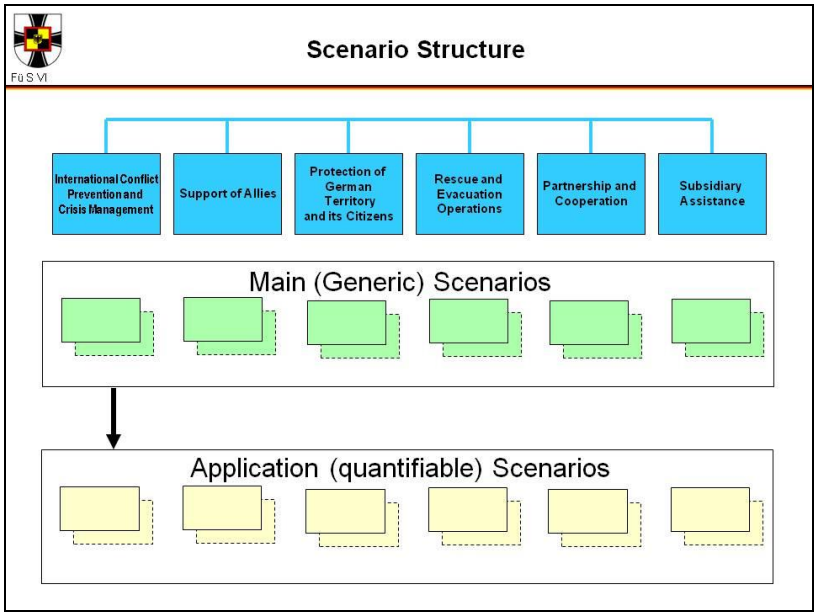

Figure 5: A hybrid approach- generic scenarios by mission type supported by real-world "application" scenarios as case studies (Germany)

The majority of defence scenarios in use within the nations were focused primarily on military issues, although all acknowledged the role and contribution of non-military capabilities. There was a general recognition of the potential for cross-use of common scenarios across different Government departments or agencies, and many nations had made initial attempts at such harmonisation. However, organisational barriers and procedural differences meant that only a very few nations had successfully applied cross-governmental scenario development to any significant degree.

Most of the participants recognised that it was important group or categorise scenarios to align them with defence policy and guidance. Some nations have adopted the NATO mission type classification used within the CRR to do so. Use is also made of factors such as operation scale (size) or region / location.

"Likelihood" of scenario was used as a basis for inclusion by most of the nations. This likelihood was generally assessed qualitatively. "Worst Case" was considered by some nations, but generally only as a secondary consideration.

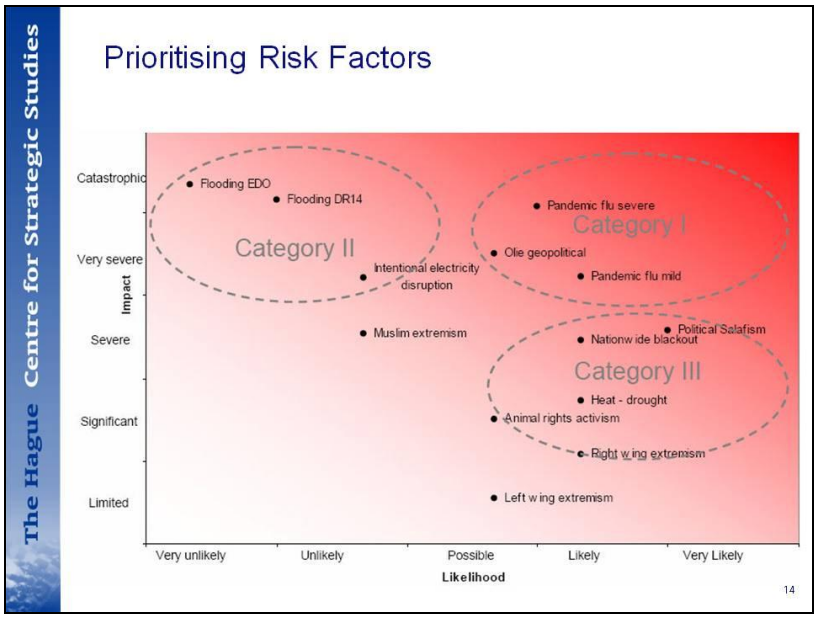

Figure 6: Formal treatment of scenario impact and likelihood (The Netherlands)

3.3 Scenario Development and Description

Close co-operation between military planners and analytic experts (typically civilian) was recognised as vital in the scenario development process. Military planners generally lead the mission analysis elements, provide guidance and oversight through out, and were responsible for reviewing and validating final assumptions and implementations. Actual scenario generation is, in most cases, performed by specialised analytical staff under military supervision.

The degree to which scenario development, selection and interpretation are centrally controlled varied across the nations. Countries with formally approved scenario-based methodologies tend to have mechanisms in place for central control over scenario development and application.

Scenarios were typically developed and specified to two broad levels of detail across the nations. At the more detailed level, scenarios are developed to the level of pseudo-operational plans, with consideration of elements such as mandate for operation, end state, geography, friendly and potential opponent force operational plans, force elements and schemes of manoeuvre. At the higher level, scenarios are described not in terms of detailed operations, but rather in terms of potential future worlds or strategic futures.

Threat definitions, orders of battle, and courses of action are usually informed by national intelligence services, although in the majority of cases the responsibility for actual implementing the detailed assumptions lies with the military-analytic teams who actually conduct scenario development.

A number of nations have implemented formal approval of defence planning scenarios. This approval typically is given at the very senior levels of the national military structure, and provides executive confirmation that the scenarios properly reflect and represent policy guidance from the respective governments.

3.4 Scenario Envelope Analysis

In general, there was no significant employment of formal analytical techniques to assess scenario coverage. However, some scenario analysis tools were in development which may allow for such analyses

to be undertaken in the near future.

The majority of nations did make use of structured parameters to scope or dimension their scenario sets. Common dimensioning parameters in use included the likelihood of the operation, the location, the balance among services.

All participants recognised the need to identify the minimum but sufficient scenario set in order to reduce overall scenario development and analysis costs. Different approaches were adopted to determine this sufficient number, drawing on aspects of national Levels of Ambition, potential mission types and the needs of relevant capability domains. In general, the number of scenarios was determined by ensuring that the whole spectrum of potential mission types was covered. Secondary considerations are to provide coverage of other principal parameters. It was by several nations that their current sets are, strictly speaking, insufficient, but that the resources required for the analysis of a "complete" set are prohibitive.

Few nations explicitly incorporated or accounted for so-called outliers in their scenario sets. However, it was recognised that such outliers could be considered "shocks". In some cases, specific consideration is made of separate treatment is given to "strategic shocks", but for the most part, there was no specific mechanism to address outliers. The majority of nations indicated that the scenario-based planning processes were primarily applied to medium-term planning (approximately 10-year timeframe). However, some nations have explicitly recognised the deep uncertainty inherent in the future security environment and the potentially risks entailed by focussing on a limited selection of point scenarios reflecting only current-day threats and appreciations.

Wide use was made of customised sub-sets of scenarios for particular domains or capability areas. Specific selections were generally made for testing specific aspects, such as capabilities, exercises, mission preparation. Moreover, focussed examinations were also carried out for individual services.

4.0 METHODOLOGIES FOR IDENTIFICATION AND DEFINITION OF REQUIRED CAPABILITIES

4.1 Scoping Capability Requirements

Strategy-to-Task or Mission-to-Task decomposition and analysis was used within most nations to support derivation of Capability Requirements. The level of formality of this approach did vary across the nations.

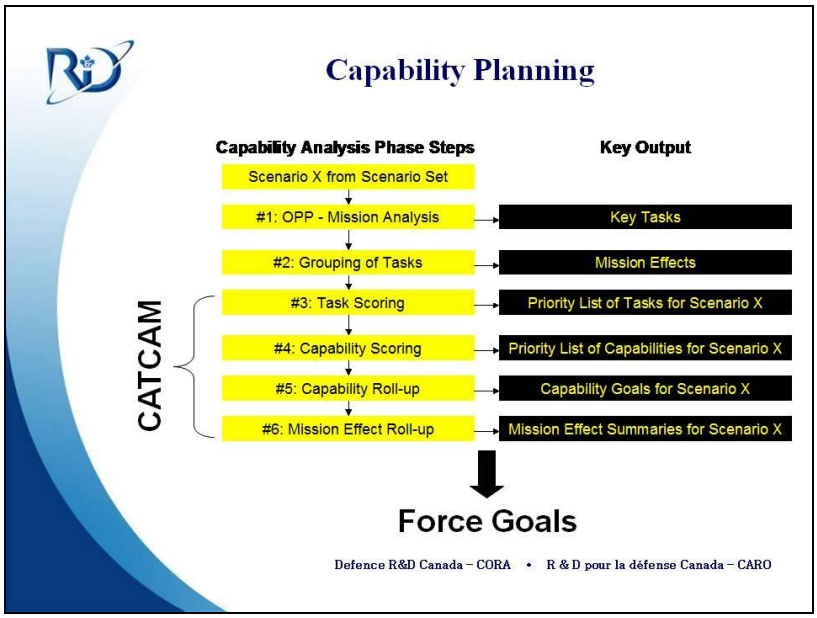

Figure 7: Role of MTD in national capability planning (Canada)

Almost all nations have developed individual capability taxonomies or frameworks, and use these to structure both capability planning organisations and analyses. These taxonomies are typically hierarchical, and incorporate functional domain decomposition to provide increasing granularity and specificity of capability need. Although the general principles are common across most nations, the specific details of the capability partitions applied at each level vary from country to country. Many nations recognised that the more detailed capability requirements at the lower levels in their hierarchies assume particular platform or unit solutions, but this was felt to be an inherent consequence of the decomposition and indeed regarded as beneficial as it provided the link between recognised military elements and higher level capability needs.

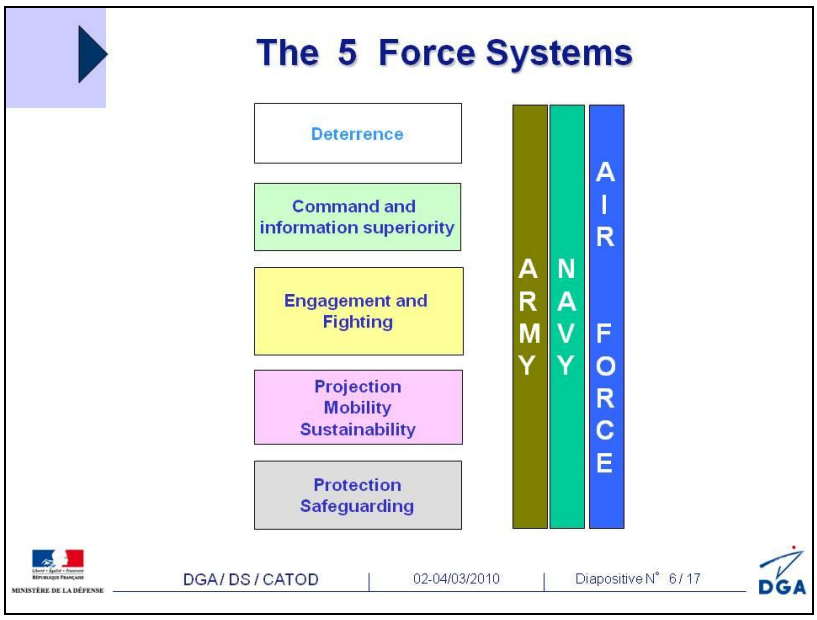

Figure 8: Top-level Capabilities as Force Systems cutting across Service Stovepipes (France)

The majority of the nations were primarily focussed on military capability requirements. It was, however, recognised that in principle there was no such thing a military or non-military capability requirement, but rather a single capability need that could potentially be delivered by either military or non-military (i.e. civilian) solutions. In these cases, whilst capabilities may not always be classified as exclusively 'civilian', there is an underlying assumption that as operations will be carried out alongside civilians, scenarios must be developed that take this into account.

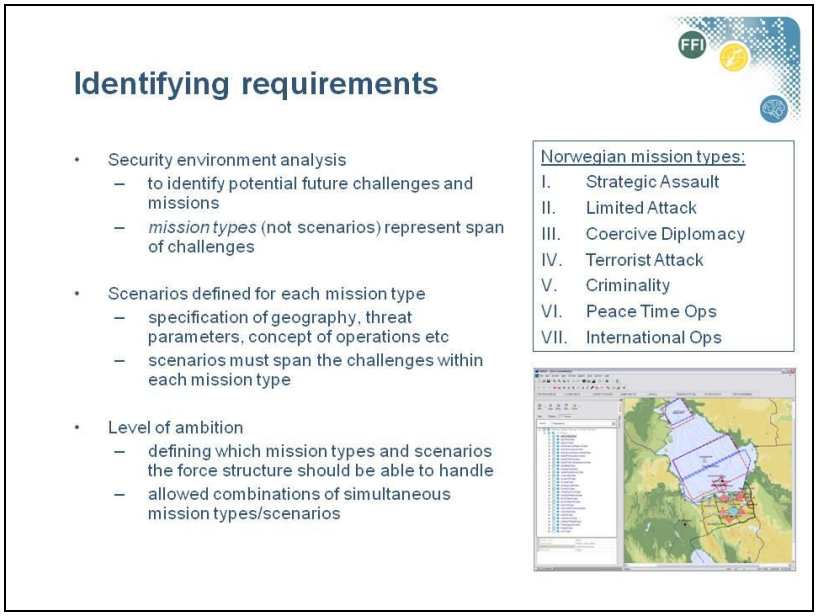

Figure 9: Role of mission types and scenarios in national planning (Norway)

4.2 Identifying qualitative capability requirements

Not all nations surveyed recognised and identified the concept of qualitative capability requirements, although the majority did. A number of nations interpreted qualitative capability requirements as facets that could be included within a quantitative requirement, whilst others interpreted it to mean less tangible requirements such as leadership qualities. Qualitative requirements were expressed, expressed, formulated and specified at a variety of levels, with solutions involving any combination of doctrine, organization, training, materiel, leadership and education, personnel and facilities (DOTMLPF).

A range of operational analysis / operational research techniques were applied to identify qualitative requirements. Substantial use was also made of structured Subject Matter Expert workshops to identify and qualify capability needs.

4.3 Deriving quantitative capability requirements

Quantitative capability analysis was almost universally conducted to derive scenario requirements. A range of operational analysis / operational research techniques were applied to enable this quantification, including the use of simulation modelling, linear programming, spreadsheets and other purpose-built tools. Military judgement and expertise was, however, generally recognised as a vital component of these analyses.

The majority of nations recognised a distinction between capability requirements and specific platform or unit solutions. This distinction varied from between an acknowledgement of likely platform to fulfil

specific capability, to a formal and explicit matching of force structures onto required capabilities.

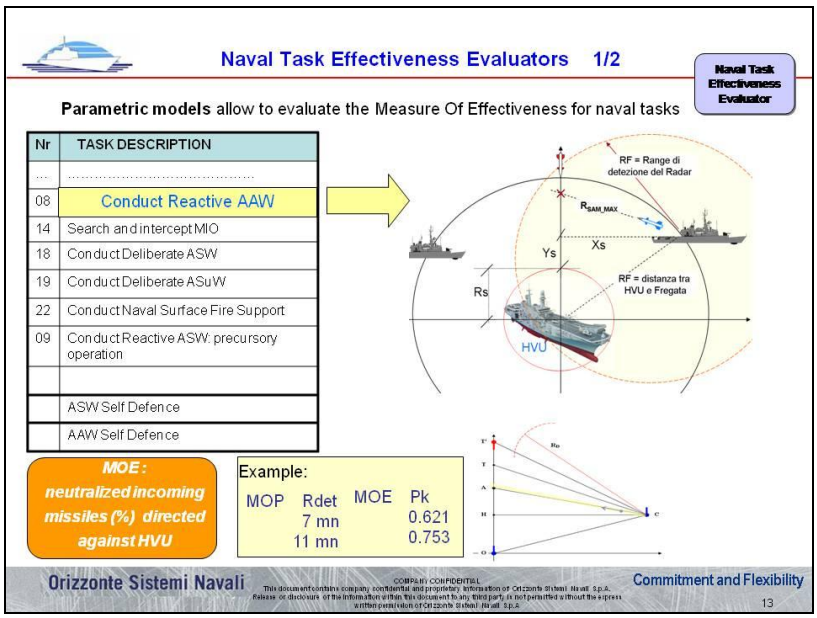

Figure 10: Quantitative MTD-driven modelling to evaluation capability requirements (Italy)

4.4 Concurrency and sequence

Most nations need to consider multiple concurrent or sequential scenarios within a national Level of Ambition.

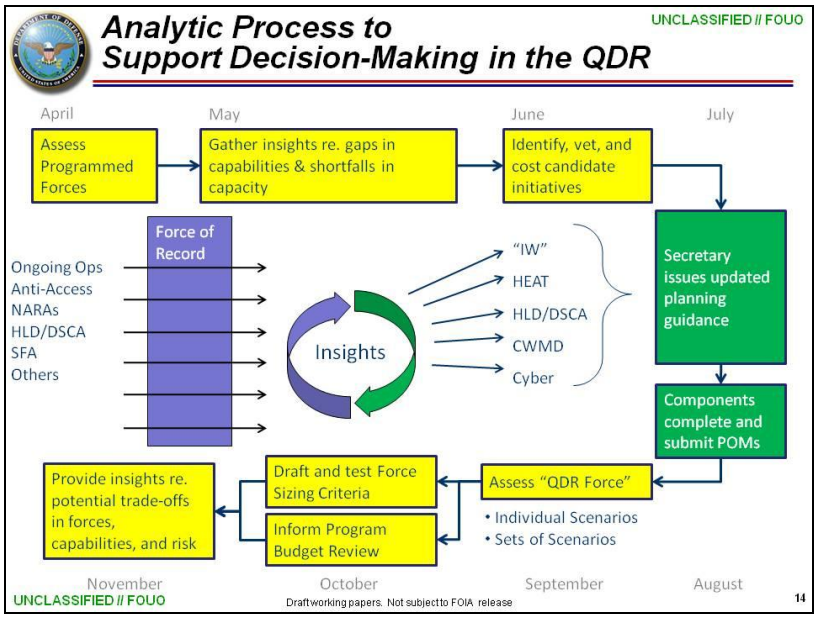

Figure 11- Structured assessment of concurrent scenario sets in the QDR (USA)

A number of nations had developed formal techniques to assess the most demanding or driving sequences of scenarios. Additional nations recognised the benefits of this approach and were in the process of

implementing an appropriate technique.

There was little consistency across the nations on the need to consider employment and reconstitution of units across multiple sequenced scenarios. Some nations do consider rotation ratios in scenarios or carry out dynamic concurrency analysis, but other nations have not yet considered employment and reconstitution of units across multiple sequenced scenarios.

4.5 Transparency, Traceability and Validity

Transparency and accessibility of results within national capability analysis was identified as a vital requirement, and one which robust operational analysis / operational research support could deliver. Many nations have implemented explicit organisations, processes and procedures to scrutinise and audit analysis results within the respective defence department. Extensive use is made of on-line publishing through the use of web-portals, as an example. Other nations cited the audit trail left as a result of analysis through the application of purpose-built tools.

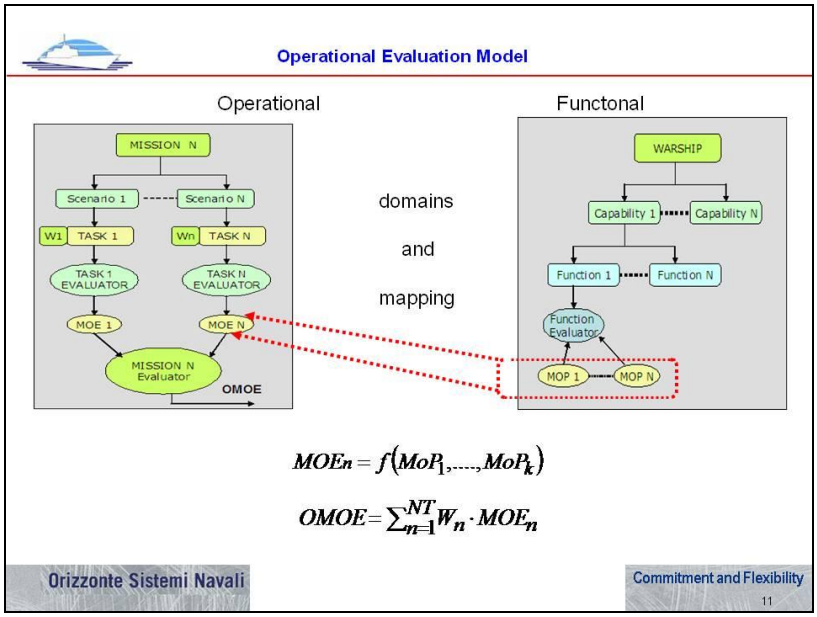

Figure 12: Traceable capability requirements- linking missions and functions (Italy)

It was clear that the incorporation of military expertise was essential to ensuring military validity of the results. All nations incorporate military guidance, and many place military experts in the lead analytical roles. It was recognised that the validation and acceptance of both processes and tools is an iterative process, and confidence and buy-in improves the more robust and established a process becomes.

Provision of traceable and repeatable results was considered to be a very important legacy of structured defence planning. The use of validation logbooks, data and assumptions papers and overall configuration management were noted as feasible ways in which results could be made traceable. It was recognised, however, that no process is infallible to mistakes, especially given the often high number of people supporting defence planning activities.

It was recognised that the defence planning process must be responsive to evolving or emerging threats and situations. Legacy capability requirements must be reassessed and revalidated to ensure relevance, and defence planning processes must incorporate an appropriate degree of flexibility in order to respond effectively to strategic shocks. Many nations employ a cyclical defence planning process, structured

around defined cycle lengths of between 2 and 4 years. Typically, these cycles are aligned with the publication of national defence strategies or white papers. Some nations have, however, transitioned to a continuous defence planning model that they believe provides a more flexible mechanism to respond to changing circumstances.

5.0 APPROACHES TO CAPABILITY BALANCING AND RISK ASSESSMENT

5.1 Capability Options Assessment

The distinguishing feature of a Capability Based Planning methodology was identified as allowing for assessment of alternative solutions as means to deliver specified capability requirements. All SMEs agreed that in principle, this was the case, but noted that this was being achieved via a variety of methods. These methods vary from external recourse to the services to more integrated solution within the planning tools themselves. Generally, such BoI studies were performed at the Joint level, considering potential solutions independent of Service. This Joint perspective was recognised as a valuable aspect of CBP, as it enhanced overall coherence in capability portfolio development.

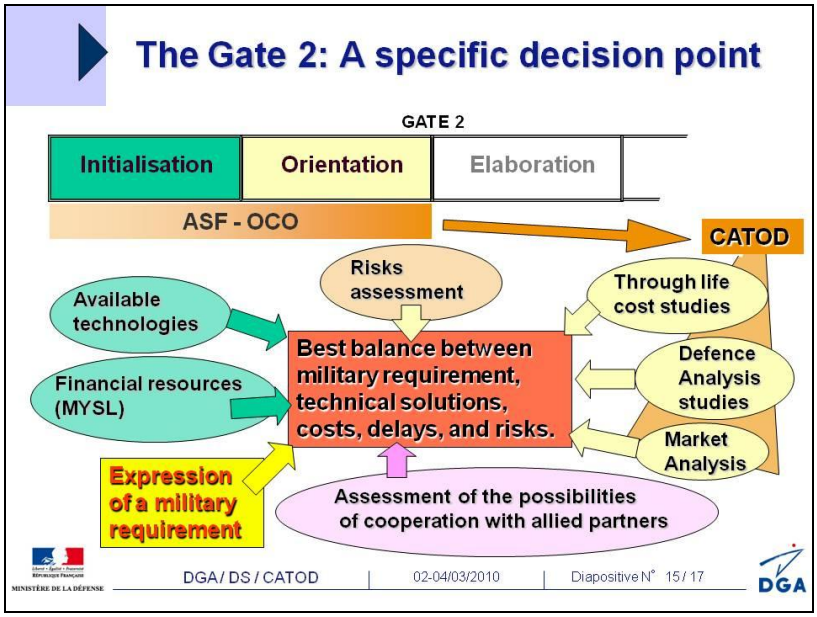

Figure 13: National Balance of Investment (BoI) process (France)

An important feature of such a CBP methodology was the ability to conduct balance of investment (BoI) studies to assess the most cost-effective means of delivering a particular capability. Some nations have developed formal methodologies and process to structure and support such BoI assessments. Techniques such as linear programming, stochastic meta-heuristics and analytical hierarchical processes have all been exploited by certain nations to support these efforts. It was pointed out, however, that the single most important feature of such studies is that they can be trusted by senior decision-makers.

5.2 Balancing current operational needs against future requirements

Cost assessment, estimation and analysis was confirmed as a significant component of national Defence Planning methodologies. Respondents indicated broad use of cost analyses, but at different levels. Costing analyses may occur but are not centrally coordinated, or occur only at the program element or system level, but not typically at the force structure level, although some nations have developed methods

to cost their entire Defence enterprise.

In general, nations applied ad-hoc processes or methodologies to balance current operational needs against future requirements. There are, however, a number of more formal approaches that have been implemented to study the trade-offs between cost and current / future risks.

5.3 Risk Assessment

In general, national Defence Planning methodologies are focussed on identifying capability gaps or shortfalls, and tracking these over time to assess capability evolution. This involves the identification of gaps during specified time frames, allowing for current assessments of when gaps are expected to occur, or to close.

Generally, a quantitative analysis is undertaken for the identification of gaps. Once a quantitative assessment is made, the presentation of these shortfalls or gaps may be qualitative, i.e. using a traffic light scheme. It was recognised that, in principle, an iterative approach to this process would be beneficial, but that budget and scheduling constraints meant that for the most part is not undertaken.

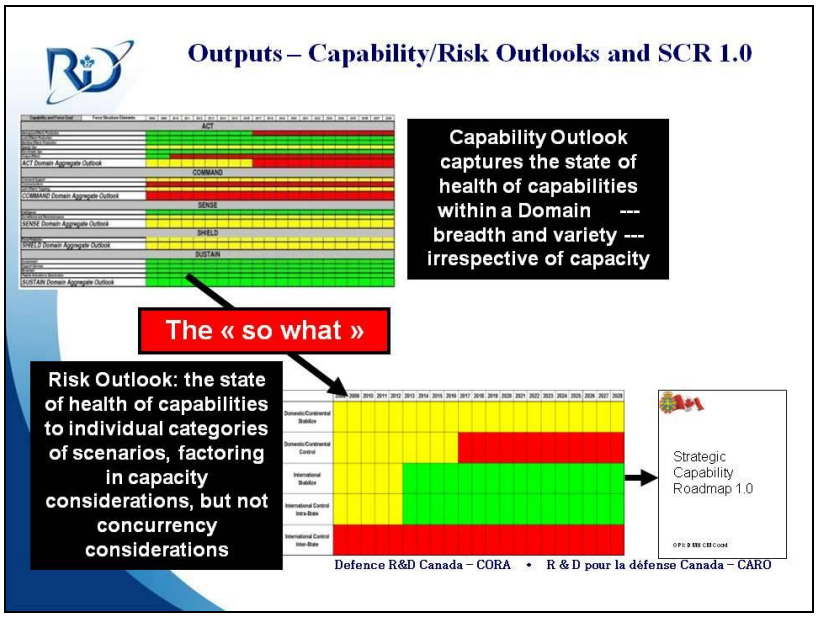

Figure 14: National capability gap and risk assessment (Canada)

Risk assessment techniques are applied across those surveyed, although it has been noted that some risks, such as risk due to shortfalls in munitions during combat operations, are more easily quantified and analysed than others, such as risk due to shortfalls in interpreters in stability operations.

6.0 PRIORITISATION OF SHORTFALLS OR GAPS

6.1 Importance of Prioritisation

Many (but not all) of the nations indicated the existence of some form of prioritised capability requirements document. In some cases, this is held at a senior (joint) level, while in other nations, multiple lists are held at the service level. The prioritisation of shortfalls or gaps in capability was

generally recognised as a component of national Defence Planning methodologies.

When the prioritised capability requirements document is held at a senior (joint) level, it tends to be very broadly applied across the military force structure. In the event that formal prioritisation is at the service level, strategic trades are addressed via decision making bodies.

6.2 Prioritisation Methodology

There was little use of formal analytic methodologies to derive the overall priorities of various capability requirements identified with your nation. Instead, senior decision-maker judgement was the most prevalent approach. Some investigative work has studied the use of analytical hierarchical process methods to structure this process but the overall response is that there is little formal methodology applied to the problem.

Normally, shortfall priorities were reviewed cyclically as part of the national defence planning process within which they are derived. However, the priorities of emerging shortfalls were typically assessed as these shortfalls become apparent. No use of damping techniques to ensure a degree of stability in the overall prioritisation was reported.

7.0 INTRODUCTION OF NOVEL CONCEPTS / SOLUTIONS

7.1 Novel Concept Introduction

Nations confirmed that both bottom-up ("I have got a great idea that will work") and top-down ("We have a problem in this area – find out what kind of solutions are available") approaches play a role in novel concept introduction. The top-down approach was suggested as best suited for long term planning, and the application of government policy to defence planning. The bottom-up approach was best suited for the shorter-term. Concept Development and Experimentation (CD&E) was noted both as a mechanism for bottom-up introduction of new technologies, and a top-down means of examining how forces could address challenges in new ways.

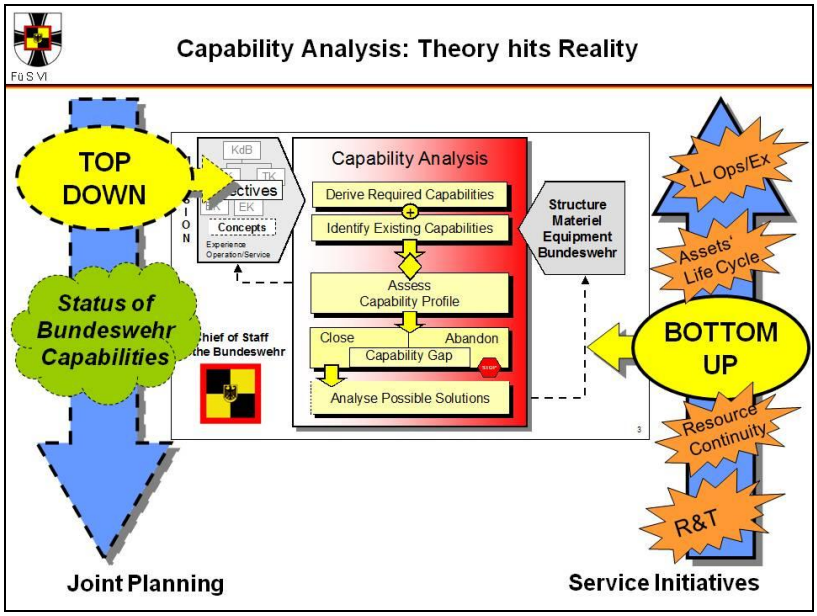

Figure 15: Top Down meets Bottom Up- a national perspective (Germany)

It was asserted that new or novel solutions generally do not alter the methodology or the scenarios used within defence planning processes. However, if a genuinely novel and paradigm-shifting solution did emerge (which was felt to be a rare event), then this solution might be tested by a careful adjustment of a scenario.

Research and Technology (R&T) or Science and Technology (S&T) were recognised as playing important roles in the Defence Planning process. S&T was engaged in the development of the process and tools which enable Defence Planning. Moreover, various nations undertake technology watch studies which assess whether new or emerging technologies should be considered in the process. Although primarily technology focussed, some S&T among the nations has investigated non-technological developments (e.g. social sciences) and attempted to identify non-platform oriented means of dealing with future challenges.

7.2 Concept Development and Experimentation

Most SMEs confirmed that CD&E is conducted in their respective nations. The primary interface was that new / emerging concepts would be subject to experimentation. Modelling and simulation was noted as a viable alternative to experimentation in some cases. In was also recognised that robust validation of experimental results was a necessary but potentially problematic area.

It was confirmed that new concepts could trigger doctrinal, organizational, material, training and/or leadership changes within national defence planning. The process for this was felt to be similar across solution work for the short, medium and long terms. However, shorter-term work tended to examine how best to employ the current force, whereas longer term work examined how best to influence or change the force structure or make-up.

7.3 Solving NATO's Needs

The nations recognised overarching requirements and solution work needed for NATO's integrated capabilities: e.g. Countering Hybrid Threats, Maritime C2 Information System, Integrated Air Defence System, C-IED, COIN, Counter Terrorism, Home Land Defence, and Maritime Situational Awareness. Approaches taken include convening coordination meetings, taking part in NATO common funded programmes, and the channelling of information on integrated capabilities via ACT.

Generally, the defence planning among surveyed nations takes into account the likelihood of cooperation with Allies when undertaking missions. However, with the exception of interoperability, capabilities tend to be developed only in the event that they are required on a national basis.

8.0 SUMMARY & RECOMMENDATIONS

The Specialist Team successfully reviewed current best practices in operations analysis support to national defence planning. Many common approaches with relevance to the NDPP were identified, especially in regards to addressing balance in national capabilities and the role played by scenario-based assessment. The unique level of expertise and understanding represented across the team ensured focussed, relevant and very pertinent discussion and debate.

The five key themes considered were of immediate relevance to the evolution of analytic support to the NDPP, specifically:

- Use of scenario-based analysis and definition of the scenario space;

- Methodologies for identification and definition of required capabilities, including gaps and redundancies;
- Approaches to capability balancing and risk assessment;
- Prioritisation of capability shortfalls or gaps;
- Introduction of novel concepts / solutions.

Participants gained significant insight and understanding of contemporary approaches and issues within national and NATO defence planning, and the open and positive discussion allowed the identification of emerging best practice. In order to ensure this best practice is reflected in the NDPP, the following recommendations have been fed into evolving NATO analytic processes:

- Scenario-based analysis should be recognised as an integral part of robust capability-based defence planning. Use of scenarios ensures maximum military validity and establishes a direct link between capability requirements and high-level policy and strategic guidance.
- Adoption of the hybrid approach for generic scenarios, similar to that now under development in certain nations, would maximise the utility of scenarios in NATO defence planning. This would establish high-level generic planning situations tied to political guidance through recognised mission types (as mandated by the NDPP Outline Model), and supported by a layer of more detailed real world case studies to allow for valid quantification and qualification of requirements.
- Implementation of the above hybrid approach would help minimise the total number of high-level generic planning situations, whilst maintaining an appropriate set of case studies to ensure analytic rigour across all planning domains. Nations typically develop between 3 and 6 representative case studies per higher-level planning situation.
- Quantitative analysis was highlighted as fundamental to the defence planning processes in the majority of nations. NATO should ensure the NDPP is supported by appropriate analytic methods that provide for military-led robust capability requirements.
- Qualitative capability requirements were either not directly recognised, or seen as a complement to the necessary quantitative results within nations. Analytic support to the NDPP must ensure an appropriate level of quantitative detail to allow identification of the complementary qualitative aspects.
- Transparency, traceability and auditability were highlighted as fundamental requirements for any defence planning process. Analytic techniques provide the necessary audit trail between political guidance and capability requirements, and are fundamental to ensuring validity and acceptance in nations. The NDPP must ensure that requirements are based on open, documented and reviewable analytic processes to avoid suspicion that they were based only on the personal views of a few individuals.
- Concept development and experimentation was confirmed as an important component of defence planning, and the NDPP must ensure that mature concepts are recognised and integrated into capability requirements development.
- Significant scope exists for bi-lateral or multilateral collaboration on scenario definition, defence planning and analytical tools across the NATO nations. Consideration should be given to future SAS activities to consider the prospects and potential benefits of such collaboration. This should

address the impact of on-going harmonisation efforts between NATO and European Union (EU) defence planning processes, as well to involve additional NATO member nations beyond the nine represented in the Specialist Team.